Biogeosciences Discussions

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Comment on bg-2022-96

Anonymous Referee #1

Referee comment on "Technical note: Common ambiguities in plant hydraulics" by Yujie Wang and Christian Frankenberg, Biogeosciences Discuss., https://doi.org/10.5194/bg-2022-96-RC1, 2022

The technical note from Yujie Wang and Christian Frankenberg focuses on still very poorly investigated area of modern plant ecology and hydrology focusing on describing and parameterizing the plant hydraulic properties as key parameters for simulation of plant or canopy transpiration and/or water uptake.

The paper is well written and can be interesting for modelers of plant hydrology to parameterize the transpiration and water transport in plant communities. The manuscript is in scope of J. Biogeoscience and can be publish in the journal after some revision.

Actually, I guess a few points have to be additionally discussed in the paper.

- All tall plant and trees are characterized by a non steady-state water transport through the soil - root- stem -branch - atmosphere system, i.e. the water fluxes at different plant segments is different e.g. root water uptake is not equal transpiration at some short time intervals. Plant tissue and leaves accumulate water which can later be used for transpiration...
- Xylems of woody plants are very heterogeneous and characterized by different hydraulic conductance (for example along radial profile). Ignoring such effect can result in biased model results.
- One of a key objectives of your study is to "highlight the commonly seen ambiguities and/or misunderstandings in plant hydraulics" including different sections and particularly the "(4) stomatal model representations". Unfortunately this section is very poorly discussed in the manuscript.

Specific comments.

"The risk of stomatal opening" is not the best term for the sentence from ecological point of view. Stomatal opening and closing are very important physiological processes in plants. It is better to use the term e.g. "stomatal response", "stomatal functioning", or any. So, I suggest to reformulate the sentence.